1. Do we need refrigerant at recycle stream? When reaction is happening at high temperature. Show her price of refrigerant and if ok to use.

Depending on where we are letting out to…not necessary

1. How to energy balance?

done

1. How much refrigerant/cooling water we need?

=How much heat is generated should tell us how much cooling water we need

1. How much catalyst we need? How to find that?

How long for 1st and 2nd…may not need large volume. How long we need to be in, residence time. Ask Dennis/Bill

Find reactivity and selectivity

1. Do we need cooling tower?

Sharing with other grp their cooling tower.

Look into air coolers

Look into heat effluent exchange

1. Cobalt propionate or cobalt halide which to choose?
2. How to include catalyst in aspen?
3. Have you contacted Adam Kenya about the Sulfur concentration of syngas from foxtrot?

She talked to him but Adam will talk to foxtrot so that they find a solution for it.

1. Specifics on utility costs? What do we include?

Add into the ppt

**Use multiple stage compressors with ethylene**

I’m doing slides: applicable standards to catalyst info of cobalt halide

More hydrocarbons are stored in spheres

Vapor pressure will be high for ethylene

Things to add to the power point:

Add a row for temps and pressures for each stream number

Enthalpy can be found from aspen in the stream summary, use those, they’re fine. If we don’t want to use, address that we don’t and state how we’ll find it.

Change 30kt/yr to English units

**Fix environmental review=add nickel carbonyl**

Nickel Carbonyl: OSHA has permissible exposure: 0.001ppm for gen industry, threshold limit is 0.05ppm, grp1 human carcinogen.

Cobalt Iodide: OSHA 0.1 cob/m3 (rate 3-reacts explosively with water)

**Fix block flow diagram update according to aspen-kevin**

**Update competing process slide (we are doing 1st rxn but we’re not doing 2nd)**

**Fix graphs, sharpen view**

**Cheaper to transport coal than ethylene-slide “plant location” fix it**

**Interest on loans we’re getting to build…we have negative cash flow initially?**

**How long will it take to build the plant?**

**Delete 3rd point on slide: estimates**

**Slide: catalyst of nickel carbonyl change unit to English**

**Plant Standards EPA, ASME (for pipe standards), OSHA, and FDA: find out product purities, to be generally recognized as a safe list,**

**Price graph: need a current date**

**MB in hand calc**

**Catalyst life? Nickel bought every yr but cobalt, include the cost as an initial cost as well as annual**

**Selectivity of catalyst?**

**Recovery of catalyst? Flash, not sure if we’re getting 100%**

**We r reacting in gas phase in 1st reactor**